

Knowledge Creation and Industry Cluster Learning

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Abstract

Industry clusters generally demonstrate superior performance outcomes relative to the rest of the industry population (Porter 1990) at the level of their individual member firms, as well as the entire cluster. The economics literature explains this largely in terms of agglomeration benefits (Arthur, 1990).

However, knowledge and knowledge flows are also important determinants of a cluster's superior performance (Maskell, 2001). Resource-based theory of competitive advantage suggests that knowledge creates increased performance opportunities for those firms able to identify, access, utilise and disseminate relevant knowledge effectively (Grant, 1996). Precisely how these knowledge attributes confer superior performance on industry clusters is a topic of increasing interest (e.g. Polder and St John, 1996; Boisot, 1998; Porter, 1998; Maskell, 2001). Recent work by the author and colleagues has focused on complexity theory approaches to cluster evolution (Arthur, DeFillippi and Lindsay, 2001; Lindsay, 2001). In this work, clusters are viewed as complex adaptive systems, where knowledge flows occur by virtue of relationships within and outside the system.

The more in-depth question of how knowledge is created, utilised and transferred in an industry cluster still requires better understanding. For example, given that knowledge is essentially a property of the individual, though largely embedded in relationships between individuals (Boisot, 1998), what is the process by which knowledge flows from individuals to companies and to industries or industry

subgroups (such as networks and clusters)? Furthermore, how do these flows contribute to the creation of new knowledge, where individuals and their relationships are the primary channels?

The 3-ways of knowing framework, developed by DeFillippi and Arthur (1996) in the context of career development, and more recently extended to its role in communities (of practice), companies and industries (Arthur, DeFillippi and Jones, 2001), provides a useful approach to answering these questions. 'Knowing why' refers to an individual's motivations to develop knowledge generating and sharing relationships, as, for example, in the formation of communities of practice. 'Knowing how' is an individual's utilization of knowledge, represented by their skills and expertise. 'Knowing whom' involves an individual's links and relationships through which knowledge is created and shared.

This paper conceptualises the 3-ways of knowing framework operating within and across individual, community, company and industry (cluster) contexts as a 'virtuous cycle of knowledge', highlighting its ever-increasing and self-generating properties of engagement with organisational learning – consistent with the view of clusters as complex adaptive systems. Firstly, the paper considers the role of the 3-ways of knowing framework in the creation and flow of knowledge associated with the evolution of industry clusters. Secondly, these ideas are explored in the case study example of the New Zealand boat building cluster, building on earlier work with this industry sub-group (Lindsay, 2001). Specifically, the manner of interaction between the 3-ways of knowing through the levels of individual, community, company and industry cluster is examined. It is proposed that the dynamic interplay between these three components of learning enable the ongoing creation of new knowledge in the cluster, essential for its sustained economic performance (Lindsay, 2001). Thirdly, the manifestations of this ongoing interaction process, in terms of the firm- and cluster-level accumulation of cultural, human, and social capital, and their contribution to cluster-level learning, is investigated. The research parallels similar issues relating to the project-based enterprise described recently by Arthur, DeFillippi and Jones (2001), and is helpfully informed by their learning process framework.

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